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Inclusive agribusiness under climate change: a brief review of the role of finance

Remco Oostendorp[1], Marcel van Asseldonk[2], John Gathiaka[3], Richard Mulwa[3], Maren Radeny[4], John Recha[4], Cor Wattel[2] and Lia van Wesenbeeck[1]

Inclusive agribusiness models aim at benefitting broad layers of the farming population in developing countries, not only farmers in well-structured value chains, but also (remote) subsistence smallholders producing for local markets. Under climate change, inclusive business models also need to be made climate-smart to increase the farmers' resilience. In this paper we provide a brief review of the role of inclusive finance as an inherent as well as synergetic component of inclusive agribusiness models. Financial institutions have difficulty in reaching out to remote smallholders, and community-based organizations often lack capacity to upscale financial services. This limits many farmers in their capability to deal with increasing climate risks. Closing this finance gap requires innovations in delivery models, and in financial products and services. Developing such adapted products requires better insight into the financial lives of smallholders, particularly under climate change, for instance from further research into climate-smart financial diaries.

Addresses
[1] School of Business and Economics, Development Economics, Vrije Universiteit, and Amsterdam Centre for World Food Studies, Vrije Universiteit, De Boelelaan 1105, 1081 HV Amsterdam, The Netherlands
[2] Wageningen Economic Research, Wageningen University and Research, Hollandseweg 1, Wageningen, The Netherlands
[3] School of Economics, University of Nairobi, P.O. Box 74697-00200, Nairobi, Kenya
[4] CCAFS East Africa and ILRI, P.O. Box 30709-00100, Nairobi, Kenya

Corresponding author:
van Wesenbeeck, Lia (c.f.a.van.wesenbeeck@vu.nl)

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Introduction

Inclusive business models have received wide attention in the literature as well as in policy circles, particularly in the context of the sustainable development goals (SDGs) and the promotion of the circular economy [1•]. In general, their aim is to ensure that poor and vulnerable groups are able to satisfy basic needs in a sustainable way, economically, socially and environmentally [2]. An inherent component of inclusive business models is inclusive finance given the pivotal role of finance in businesses. Inclusive finance provides for affordable access to financial services to all people, that is also to poor and vulnerable populations [3••]. This is particularly relevant since new sources of stress emerge for poor farmers, including climate change, resulting in increasing weather variability and shifting seasonal timing. While many studies focus on factors that influence adaptation and coping decisions [4,5] and the impact of such decisions [6–8], available studies linking finance and adaptation usually focus on functional properties of finance for funding short-term input purchases, often ignoring actual financial coping mechanisms of the financially excluded (for example household consumption smoothing and precautionary savings) [9]. Another literature focuses on the link between access to finance and development, but does not specifically focus on the relation with climate-smart interventions [10,11]. Our paper therefore seeks to explore the links between inclusive finance and climate-smart agriculture.

The present article first elaborates why farmers need to invest in new climate-smart practices. Next it argues that farmers need access to a wide array of inclusive finance options, to fund their investments in climate-smart agriculture. It is also discussed how inclusive finance and inclusive business are related, where the former is not only an inherent component of the latter but both are mutually reinforcing. The article continues explaining that a vital aspect of financial inclusiveness is universal access to *tailor-made* (climate-smart) financial services. This would allow poor and neglected groups to become more resilient against shocks. It can also help farmers to connect to inclusive agribusinesses and value chains. However, the development of tailor-made solutions requires in-depth insight into the options and challenges

of smallholders. Hence, the article finishes with a new agenda for financial research to align financial services with inclusive business models, particularly in the context of climate change.

Farmers need to invest in climate-smart agricultural (CSA) practices

Climate change increases the risk and uncertainties of farming, at least in the context of many lower-income countries. It triggers changes in temperatures and rainfall, and makes the weather less predictable for farmers. This induces changes in the sowing and harvesting periods for crops, often shortening the cropping season. In livestock production, climate change affects water and feed availability as well as animal health. Thus climate change adds to financial stress and risk in agriculture.

These changes trickle down into alterations in the farmers' cash flow patterns throughout the season. As a response, farmers may need to change their practices and invest in specific climate smart agriculture (CSA) measures, with corresponding new (and better) cost-benefit-risk profiles [12]. Where such investments cannot be financed, some forms of farming may become unviable in their traditional production domains.

Climate-smart and inclusive finance needed

But can farmers finance these investments? Only a quarter of estimated demand for finance is met, which shows that financial exclusion is still an unresolved problem—at least for smallholders [13]. The majority of on-farm investments is self-financed, with a large share coming from informal finance: family, friends, community finance, and moneylenders. Smaller portions are financed from formal and semi-formal financial institutions (banks, savings and credit cooperatives, and microfinance institutions), and from value-chain actors (buyers, traders, processors, agrodealers, warehouses) [11].

As only a minority of smallholder finance originates from value chain actors, a broader concept of financial inclusion is needed. Financial resources from outside the chains are needed to enable farmers to invest in CSA. This encompasses different channels and sources of financing for farmers. Such networks of inclusive finance, including but not limited to the value chains, increases the scope for on-farm investments that further decrease the vulnerability to climate risks and assure even more stability in output and income.

Two reservations ought to be made, before we further elaborate on how climate-smart financial inclusion can be realized. Firstly, even an inclusive financial sector is not necessarily reaching out to all actors influencing climate change mitigation and adaptation. Even climate funds channeled through investor networks may predominantly be flowing towards the better structured value chains, covering only a limited number of farmers. The majority of smallholders thus remain underserved or simply unreached by current financial products, not only when provided by inclusive finance players but also by global climate finance funds [14].

Secondly, generically increasing access to credit may not always support more sustainable agricultural practices nor more inclusive agribusiness models. There may be implicit incentives built into financial services that may have ambiguous impacts on agricultural and land use practices. For example, access to credit may stimulate the use of industrial fertilizer at the expense of other forms of soil fertility management [15], or it could enable larger players to acquire land, pushing smallholders to the margin and into unsustainable practices.

Inclusive finance and inclusive agribusiness reinforce each other

As noted, inclusive finance is inherent in inclusive business because of the pivotal role of finance in business. At the same time, inclusive finance and business can mutually reinforce each other (synergies).

Even if only a minority of small farmers is well-linked with agribusinesses and value-chains, inclusive and climate-smart finance could be a stimulus for inclusive business by providing a stepping stone for farmers to become embedded in inclusive value chains.[5] If farmers become more resilient to climate shocks, it will help them to become reliable supply partners for agribusinesses,

Also from the perspective of investors and agribusiness companies, there are natural connections between inclusive agribusiness, inclusive finance and CSA. First of all, agribusinesses are themselves financed by banks or investors, and have to match their ambitions on inclusiveness and climate action with their financiers. For example, international development finance institutions (DFIs), social investors and impact investors tend to use social and environmental standards for their agribusiness investments. Some of these standards mainly mitigate risk for the investor (e.g. the International Finance Corporation Performance Standards), whereas others are more ambitious in actively pursuing certain social or environmental goals [17]. So the inclusiveness goals of the financiers influence the agribusinesses in their climate-smart behavior.

Secondly, local banks and microfinance institutions may leverage the inclusiveness agenda of agribusinesses, by using the agribusinesses as 'aggregators' through which

[5] While inclusive businesses can be supplier-oriented, consumer-oriented, and/or employee-oriented, we are focusing here on the first category. In the agri-context, this refers to agribusinesses that seek to source raw materials or goods from poorer farmers [16].

they can channel financing to smallholders. Third, and *vice-versa*, smallholders can use their relations with agribusinesses to get access to financing, by using off-taker contracts as bank security, or by receiving financing from the agribusinesses for agricultural inputs. Also, and finally, agribusinesses can forward their climate engagements with financiers to the smallholders they work with, by enforcing certain sustainability standards, or by supporting farmers in making their production practices more climate-smart [18].

Inclusive finance requires tailor-made financial service

Inclusive and climate-smart finance should respond to real needs of excluded people. Given the fact that current products and delivery modes have left them excluded, new products and ways of reaching excluded people should be developed, and access barriers to formal financial institutions removed [3••].

Microfinance is often mentioned as the key factor in bridging the gap between formal financial institutions and excluded people [3••], and indeed, microfinancing can significantly ease the plight of the poor. [19] One way of organizing micro-credit is through savings groups, where people (in many cases females) set aside small amounts of savings for credit provision to group members. Where these village networks function well, farmers may at present not feel a need to turn to formal institutions. However, in general, microfinance provided by savings groups is too small to fill the finance gap when investments exceed small-scale input loans. Hence, it is questionable whether savings groups can fulfill the role of 'bringing farmers inside agribusiness' to enable CSA investments on a larger scale. Moreover a trade-off exists between the inclusion of ultra-poor households into a savings group and its ability to provide credit to these households [20]. Systemic climatic risk reinforces the need for larger institutions with a more diversified portfolio, and micro finance institutions and savings credit cooperatives [21] could be the natural solution for this. However, governance may become a real issue when these institutions scale up [22] as mechanisms to maintain trust and transparency at small scale do not carry over to larger scales.

New product development requires understanding of farmers' financial lives

The need for tailor-made financial services implies the development of new products - including new services and delivery models and/or the adaptation of existing ones. Both adaptation and development of new products that are responsive to actual smallholder financial needs require understanding of farmers' lives [23]. Three conditions make smallholders a challenging client segment for financial service providers: (i) agricultural income is erratic and infrequent, (ii) required investments can be significant and need to be made at specific times of the year, and (iii) high incidence and covariance of risk which are hard to mitigate[24]. Financial service providers tend to look at uptake of single products only, which is insufficient given that smallholders use a wide range of financial tools throughout the season and for different purposes [25].

One of the most promising methods increasingly used for understanding financial coping mechanisms is that of *financial diaries*, longitudinal surveys recording all financial transactions by household members. Financial diaries were first used in behavioral microfinance academic research [26], and the book *Portfolios of the Poor* [27••] has become the landmark publication on diaries. Financial diaries provide unparalleled granular insights into financial stress, financial partners, and uptake of financial products for different types of households/individuals, highlighting exclusion/inclusion criteria related to for example gender, ethnicity, wealth and intra-household equity [24••,28].

Limitations of financial diaries have also been noted: samples are often non-random and relatively small; it is difficult to interview the same respondent many times; and costs are high [25,28]. Diaries may enhance financial literacy and thus have a direct impact on financial behavior and outcomes, reducing the validity of diaries as a measurement instrument [29]. At the same time, recall error and distrust are reduced through repeated interactions with respondents, but even then, possibly stories within the household 'will not add up' when household members keep transactions hidden from each other [30].

Given the need for new inclusive climate-smart financial products, the financial diaries tool should also become climate-smart as more knowledge is required on how CSA affects the 'bankability of the poor'. A common assumption is that CSA leads to higher, more sustainable, less risky incomes, but requires sizeable investments [31,32]. But how exactly does CSA affect financing needs of smallholders considering their complex portfolio with interlinked multiple financial instruments? To what extent does CSA improve smallholders' risk profiles? Is there enough local finance available to scale CSA?

Smallholder diaries linking information on transactions with data on climate-smart agricultural activities can reveal the financial needs of CSA farmers for developing new financial services and delivery modes that benefit farmers and are profitable for lenders, aggregators or other potential value chain partners—hence supporting more inclusive and more sustainable agribusiness models.

The recently launched research project 'Using Climate-Smart Financial Diaries for Scaling in the Nyando Basin,

Kenya' within the CGIAR Research Program on Climate Change, Agriculture and Food Security (CCAFS) exemplifies the innovative climate smart financial diaries approach [33]. It builds on the recently developed Climate-Smart Village approach that aims to scale up and scale out the appropriate CSA options [34]. One of the most promising CSA options for the Nyando region combines drought-resistant breeds of goats and sheep with horticulture and agroforestry—a food production system that is inclusive, climate-resilient and climate smart in closing nutrient cycles. The climate smart dairies methodology can provide key insights for the design of a conducive financial environment for supporting the scaling of these inclusive and sustainable business models.

Conclusion

Inclusive finance plays a critical role in making agribusiness models more climate-smart and inclusive for small farmers. Weather variability and long-term structural shifts in seasons are emerging sources of financial stress for farmers. Many studies focus on the factors that influence adaptation and coping decisions [4,5] and the impact of such decisions [6,7,8]. This has created a considerable evidence base on the sustainability effects of CSA practices [35]. However, available studies linking finance and climate-smart adaptation are usually based on rather straightforward thinking, ignoring the actual financial coping mechanisms of the financially excluded [9]. Financial diaries bring out the potential role of inclusive finance to support smallholders and other financially underserved stakeholders to build inclusive and climate-smart business models. Exploring the full potential of this tool for the design of tailor-made financial products to serve the underserved clearly is part of a future research agenda for inclusive business development.

Conflict of interest statement

Nothing declared.

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